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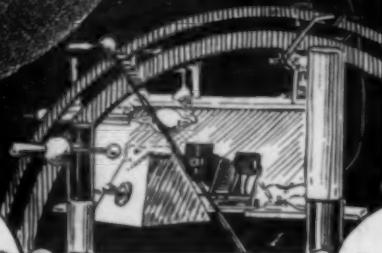
September, 1903.

THE AMERICAN

X-RAY JOURNAL

A MONTHLY
DEVOTED
TO THE
PRACTICAL
APPLICATION
OF THE
NEW SCIENCE
AND TO THE
PHYSICAL
IMPROVEMENT
OF MAN.

CHICAGO, ILL.



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THE AMERICAN X-RAY JOURNAL

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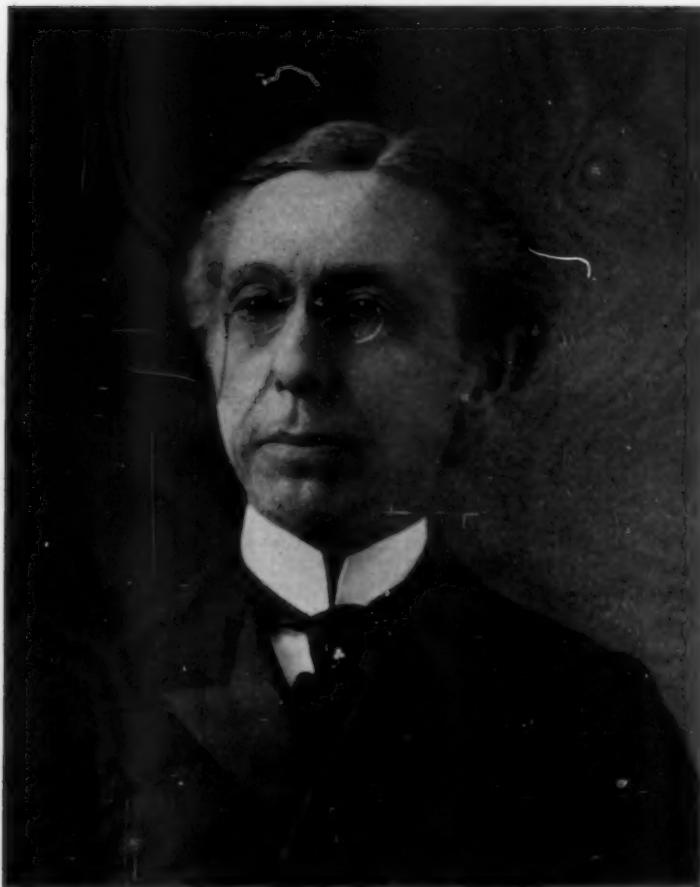
CHICAGO, SEPTEMBER, 1903.

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DR. A. D. ROCKWELL,
President American Electro-Therapeutic Association, 1903-4.

THE AMERICAN X-RAY JOURNAL.

Devoted to Practical X-Ray Work and Allied Arts and Sciences.

VOL. XIII.

CHICAGO, SEPTEMBER, 1903.

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Electro-Therapy.

A Course of Twenty-four Lessons under the auspices of the Chicago College of X-Ray and Electro-Therapeutics

LESSON 4—PRINCIPLES OF ELECTROLYSIS.

When a solution forms part of an electric circuit the passage of the current is always accompanied by decomposition of some of the salts in solution. Such a decomposition is called electrolysis (electric loosening). Metallic plates or other conductors by which the solution is connected with the source of the current are called electrodes (electric roads). According to the fluid theory of electricity the current flows from the positive (carbon) pole of the battery along the conducting wire into the solution, then down thru the solution and out at the other electrode, thence to the negative (zinc) pole of the battery, and on thru the battery fluid to the carbon. Starting in the solution in which decomposition is taking place, and going down stream, we come to the cathode (down road) which is the electrode connected with the negative pole of the battery. Going up stream in the same solution we come to the anode (up road) which is the electrode connected with the positive pole of the battery. The names positive and negative pole or positive and negative electrode are sometimes used for anode and cathode respectively.

When an electric current is passed thru a solution of common salt (NaCl) the molecules of the salt are divided into two parts which move in opposite directions.

These moving parts of the molecule, which are considered to carry with them electric charges, are called ions (wanderers). The sodium ion (Na) moves down stream toward the cathode, and is called a cation (down-wanderer). The chlorine ion (Cl) moves up stream toward the anode, and is called an anion (up-wanderer). Metallic and basic ions are cations. This may be fixed in mind by recollecting that the metals are generally heavier than the other elements and the heavy parts are most liable to move down. The acid ions are anions, moving upstream toward the anode.

In a solution of common salt each molecule is composed of two atoms, consequently the division into ions can take place in only one way. In silver nitrate (AgNO_3) the division into ions takes place between the Ag and the NO_3 . The silver ions move down stream and collect on or about the cathode. If the cathode is clean and is a fair conductor, and if the current passes steadily at a moderate rate, the silver is deposited in the form of a coherent film over the whole surface of the cathode. This process is known as electroplating. Electroplating may be carried on with silver, gold, copper, nickel and almost any of the malleable metals. If the anode is made of metallic silver the anions (NO_3) which

collect around it unite with the silver atoms to form more silver nitrate, which is in turn decomposed and deposits its silver upon the kathode. In this way the solution of silver nitrate remains of the same strength and acts as a carrier of metallic silver from the anode to the kathode.

The number of molecules decomposed by one ampere of current in one second remains constant for each compound. The amount of decomposition may therefore be used as a measure of the current. In fact, the commercial unit of current, the ampere, is defined as that current which will deposit from a solution of silver nitrate 1.118 milligrams of silver per second. Bearing in mind that the same number of any other kind of monovalent atoms are separated per second by the same current, it is easy to calculate the number of milligrams per second of any other element which are separated by one ampere. For example, the atomic weight of hydrogen is 1, the atomic weight of silver is 108, the weight of hydrogen liberated per second by one ampere is therefore $1.118/108 = .0104$ milligram. Copper in its common compounds is divalent, that is to say, is attached to the rest of the molecule by two chemical bonds, and therefore requires double the current to separate one atom. The atomic weight of copper is 63, consequently the weight of copper liberated by one ampere in a second is $.0104 \times 63/2 = .327$ milligram, or 1.18 grams per hour.

The electro-motive force required to begin the decomposition of a salt depends upon various things, the composition of the salt, the nature of the solvent and the physical conditions. There is every reason to believe that the forces exerted between the atoms in a molecule are identical with electro-motive forces. The electro-motive force necessary for the decom-

position of the given salt must then be great enuf to overbalance the constant pull exerted between the units in the molecule. As soon as these conditions hold decomposition begins. In a large number of solutions dissociation of the ions takes place without an electric current. In these electrolytic decomposition begins with an exceedingly small electro-motive force. A solution of sulfuric acid in water, on the other hand, requires an electro-motive force of 1.47 volt before decomposition begins.

As already stated electrolysis is a splitting of the molecule into two ions. The splitting takes place between the basic and the acid parts of the molecule. In many cases one or both of the resulting ions is chemically unstable, and secondary changes in such ions necessarily occur. While there is no doubt that these secondary changes are of the same nature (electrolytic) as the original splitting up, it is more convenient in the present state of our knowledge to consider them as merely chemical. In the electrolysis of sodium chlorid (NaCl) the sodium ions are unstable in a water solution. Metallic sodium placed in water displaces part of the hydrogen, setting free hydrogen gas, and forming sodium hydroxid which remains in solution,



Sodium ions behave in exactly the same way. Instead of finding metallic sodium at the kathode we find hydrogen gas bubbling off, while the solution around the kathode becomes alkaline.

The chlorin anion (Cl) is a little more stable in a water solution, so that if the anode is of such material that chlorin does not readily combine with it we will find some chlorin gas in the solution around the anode and some being given off. Chlorin, however, has a slight tendency to decompose water, uniting with

the hydrogen to form hydrochloric acid and setting the oxygen free.



If there happens to be in the solution any substance with which oxygen readily unites, such as ordinary organic matter, the change indicated by this equation invariably takes place, giving us an acid (HCl) and oxygen at the anode.

In electrolyzing a solution of potassium iodid (KI) the kation (K) decomposes the water in the same way as the sodium ion, forming caustic potash (KOH) and setting hydrogen free. The iodin (anion) is unable to decompose water and appears as "metallic" iodin, unless there should be some other substance, such as a metal, starch, or cellulose, with which it may unite. The iodid of starch is a deep blue, so that a piece of paper wet with starch paste containing a solution of potassium iodid is often used as a detector to determine the direction of the current. The two ends of the wire being placed near together upon a wet piece of this starch paper, the current decomposes the KI ; iodin is liberated at the anode and immediately unites with the starch to give the deep blue color. The potassium at the kathode gives no color.

Oxygen when liberated by the electric current nearly always contains a considerable portion of ozone and is chemically more active than the oxygen of the air.

When an electric current is passed thru the body the chemical effect which has just been described is produced upon the salts in solution in the tissues. The ions move toward the anode and kathode respectively, just as in the solution of common salt. The most abundant of the mineral salts in solution in the body is sodium chlorid; consequently the reactions described above may be considered as representative of the chemical changes which take place when the electric cur-

rent is passed thru the body. Near the kathode we find the tissues become alkaline and deoxydized. Near the anode the tissues are found to be acid and are more fully oxydized. The effect of the alkali at the kathode is to soften and dissolve albuminoids. The effect of the acid at the anode is to coagulate and harden albuminoids. These two effects in greater or less degree are characteristic of the two electrodes, and are found in all cases in which a direct current is passed thru any part of the body. The effects upon the blood are slightly different. When a fairly strong current is passed thru fresh blood a firm, dense, coherent clot is formed around the anode, while a soft and easily friable clot is formed around the kathode.

Decomposition of a salt in contact with the surface of the body in such a manner as to convey one set of its ions thru the membrane into the body is known as kataphoresis. If a wad of absorbent cotton is wet with a solution of potassium iodid, placed on the surface of the body and connected with the kathode, the anode being placed at some other part of the body, the potassium ions resulting from the action of the current move from the body toward the kathode. The iodin ions move from the kathode toward and into the body. In this way the iodin is carried into the tissues. A solution of cocaine chlorid, similarly prepared and connected with the anode, is decomposed by the current, the chlorin ions moving toward the anode, away from the body, and the cocaine base moving into the tissues toward the kathode. In a similar way any desired ion of any soluble compound may be conveyed into the tissues.

There is a common idea that kataphoresis consists essentially of the conveyance of a fluid or a solution physically into the tissue in the direction of the current. This idea is entirely erroneous.

American Electro-Therapeutic Association. Thirteenth Annual Meeting.

Held in Atlantic City, N. J., September 22, 23 and 24, 1903.

Daniel R. Brower, M. D., of Chicago, President,

FIRST DAY, TUESDAY, SEPTEMBER 22.

Committee on Electrodes.—Mr. R. G. Brown, E.E., for this committee reported on several new electrodes. He stated that Dr. F. B. Bishop, of Washington, D. C., uses with the high frequency current an electrode having a bottle at one end and a piece of wire passing down into the water contained in this bottle. The same physician uses a very convenient electrode made out of a child's long-handled whisk broom, the handle being provided with a sliding metallic collar. Dr. Morris W. Brinkmann, of New York, uses electrodes made of glass tubes of different shapes, filled with plumbago or crushed carbon. He also uses thick-walled glass tubes containing mercury. Dr. William Benham Snow, of the same city, employs an electrode of white maple, into the end of which are fitted variously shaped tips. Dr. G. Betton Massey, of Philadelphia, has submitted some needle electrodes made of platinum iridium wire, insulated by a delicate coating of melted hard rubber, and fastened in a handle of hard rubber.

Penetration of Glass by the High Frequency Current.—Dr. Francis B. Bishop, of Washington, D. C., was of the opinion that the following experiment demonstrated that the high frequency current can penetrate glass and transmit through the glass metallic and liquid substances. The current from a Piffard coil excited by a Toepler machine of twelve revolving plates was employed. A solution of starch was placed between two glass plates, 8 by 10 inches, and sealed by fas-

tening paper over the plates with starch paste. A solution of iodid of potassium in glycerin was placed in the center of the upper plate, and the lower plate was placed on a metallic surface and connected with the earth. The spark was directed on the iodid solution, and in a few minutes iodid of starch was formed. Dr. Bishop then treated some cases of joint disease with the high frequency current, applying to the joint externally, and using his hollow glass electrode filled with starch solution. After using this electrode for several weeks, small particles of iodid of starch could be seen floating in the fluid.

Mr. R. G. Brown believed that the current had not traversed the plates, and that the result would have been different if the plates had been hermetically sealed.

Dr. Albert C. Geyser, of New York, suggested that the blue color obtained was not due to the formation of iodid of starch, but to ozone.

Tests of Dry Cells.—Dr. Williams J. Herdman, of Ann Arbor, presented, for the committee on constant current generators and controllers, a report of some laboratory tests upon a new dry cell.

The Effects of Secondary Static Currents in Removing Albumin and Casts from the Urin.—Dr. Boardman Reed, of called attention to the fact that in many cases of chronic gastro-intestinal disease hyaline casts and albumin may be found in the urin, and that as these cases often proved amenable to dietetic and other treatment, it was probable that the condi-

tion was one of auto-toxic nephritis arising from the action upon the kidneys of the toxines formed during abnormal digestion. Following in the footsteps of Dr. A. D. Rockwell, he had, during the past year, observed eighteen such cases, four of which he reported. In three of these cases treatment with static electricity had controlled the albuminuria. The faradic current had not proved so useful, and the wave current had seemed to him inferior to the static induced current.

Dr. W. B. Snow thought if Dr. Reed had used a sufficiently large spark gap he would have found the static wave current superior to the static induced.

Dr. G. Betton Massey spoke of a case of glycosuria in which he had succeeded for some time in controlling the quantity of sugar excreted in the urine by the application of static electricity.

X-Ray and Light in the Treatment of Tuberculosis.—Dr. Russell Herbert Boggs, of Pittsburgh, presented this com-



MEMBERS AND VISITORS, AMERICAN ELECTRO-THERAPEUTICS ASSOCIATION,
ATLANTIC CITY, N. J., SEPTEMBER 22, 23, 24, 1908.

Dr. A. D. Rockwell, of New York, said that there seemed to be no sharp line between inflammatory and organic disease of the kidney, and that electricity was capable of reducing congestion and improving the nutrition of the kidney. It should be remembered that this treatment, useful though it was, was only applicable to occasional cases of mild affection of the kidney. In his own cases, treated in this manner, the treatment had extended over periods of from three to eighteen months. He did not, of course, claim to cure true Bright's disease by electricity.

munication. He firmly believed that these therapeutic agents were of very great value as an aid in the treatment of tuberculosis, no matter where situated. He warmly advocated the use of the coil, believing that x-ray treatment with the static machine was much more difficult and uncertain. The light treatment he gave on alternate days with an exposure of ten minutes.

Dr. W. B. Snow expressed the opinion that, if properly used, the static machine was capable of yielding just as good results as the coil, and he took exception to the author's statement that the fluoro-

scope afforded a better test of the quality of the tube than the spark gap.

Dr. Robert Reyburn, of Washington, D. C., advanced the theory that the x-ray produced its beneficent results, both in tuberculosis and cancer, by surrounding the morbid cells with an inflammatory product, thus preventing systemic infection.

Dr. T. A. Pease, of Norwood, N. Y., narrated a case of tuberculosis of the glands of the neck which he had cured by static electricity.

Dr. Francis B. Bishop supported the reader of the paper in his contention that, as a rule, the coil yielded better results. To equal the coil, the static machine must be very powerful, must be run at a high rate of speed, and must be employed in conjunction with a high vacuum tube. Personally, he preferred the Toepler to the Holtz machine. His own experience in the electrical treatment of tuberculosis had been most encouraging, even when the patient had only been subjected to the convective discharge from the cage.

Dr. George Z. Goodell, of Salem, Mass., reported a case of tuberculosis of the glands of the neck which he had treated electrically for three months without any apparent improvement. He employed a tube excited by a Kinraide coil and a spark gap of three inches.

Currents of High Frequency, Apparatus and Therapeutic Uses—Dr. Francis G. DuBose, of Selma, Ala., was the author of a paper with this title. In his absence it was read by Dr. Massey. The paper was devoted chiefly to the description of an apparatus used in France, which gave a current said to have several million oscillations per second. It was stated that the nerves were unable to respond to these very rapid vibrations, and that accordingly a current of this kind of 400 milliamperes could be passed without producing pain. This current

had been found especially useful in the treatment of chronic rheumatic joints.

Dr. A. D. Rockwell was skeptical about this current having so great an amperage, and expressed the belief that it was probably not over four or five milliamperes.

Dr. Francis B. Bishop said he had recently seen a sixteen-candlepower lamp brought to full incandescence with a D'Arsonval coil.

Electricity in the Treatment of Chronic Deafness.—Dr. George Z. Goodell, of Salem, Mass., presented in this paper the results not only of his own experience, but of knowledge gleaned from a study of the literature and of responses received to a circular letter of inquiry that he had issued. He said that several observers said that they could relieve the tinnitus by a mild interrupted current, but better results were obtained from the continuous current with the positive pr'e to the ear. The value of electrolysis of the eustachian tube was still a mooted question.

Clinical Report on the Use of the X-Ray in Lesions of the Spinal Cord—Dr. Charles W. Daniels, of Savannah, Ga., was the author of this paper. Two cases of tabes were reported in which great improvement had resulted from x-ray treatment, and the author was hopeful that this method would prove beneficial in degenerative diseases of the spinal cord when begun sufficiently early.

Employment of Static Electricity in the Treatment of Nervous Diseases.—Dr. William Benham Snow, of New York, read this paper. He said that there were few diseases of the nervous system that were not associated with inflammation and impaired nutrition, and electricity was potent to relieve just such conditions. For the purpose he preferred the wave current. In acute neuritis he made use of long sparks; in chronic neuritis the sparks should be directed chiefly to the

region in which they caused the most pain.

Dr. R. J. Nunn, of Savannah, Ga., gave expression to this belief that all electrical currents presented vibrations, and that the lower vibrations were simply diluents of the higher ones.

Dr. Charles O. Files, of Portland, Me., and Dr. J. R. Stuart, of Minneapolis, spoke of the power of electricity to relieve congestion, the latter gentleman referring particularly to the high frequency current.

Electrical Treatment of Trachoma and Corneal Opacity.—Dr. Margaret A. Cleaves, of New York, presented in this paper a detailed account of a severe case of long-standing trachoma that had yielded a brilliant result from the use of zinc electrolysis. She had made thirty-seven applications during a period of three and a half months, using two and a half milliamperes of current and an indifferent electrode of eleven square inches at the nape of the neck. In ten days the sago bodies had disappeared. The young man was cured of his trachoma in June, 1896, and the next October an attempt was made to treat the corneal opacity by kathodal electrolysis, using one milliampere of current for two or three minutes three times a week. The boy had recovered and was in business.

The Successful Treatment of Eighteen Cases of Granular Lids by the X-Ray and High Frequency Vacuum Electrodes—Dr. Albert C. Geyser, of New York, read this paper. Exposures of three to five minutes were given on alternate days, the tube being kept six or eight inches away, and after two or three weeks of this treatment the high frequency current was resorted to for the purpose of improving nutrition.

SECOND DAY—WEDNESDAY, SEPTEMBER 23.

Exophthalmic Goitre and its Rational Treatment—Dr. Francis B. Bish-

op, of Washington, D. C., discussed the nature and cause of exophthalmic goitre, and showed a strong leaning toward the view that it was largely dependent upon the early and continued use of the corset. In addition to the electrical treatment, it was most important to see that these patients had an abundance of rest and of nitrogenous food. He had found drug medication very disappointing, and, like many others, had obtained the best results from electricity. He had, for the most part, employed the continuous current, with the positive electrode high up on the neck, and a sponge, connected with the negative pole, on either side over the pneumogastrics and thyroid. The current was gradually increased up to the point of toleration and was continued for ten or fifteen minutes on alternate days. The effect of the current on the pulse was his guide as to the strength to be employed.

Dr. T. A. Pease, of Norwood, N. Y., said that he employed adrenalin solution kataphorically to blanch the overlying skin, and then the high frequency current applied with the wooden electrode.

Dr. A. D. Rockwell was of the opinion that treatment with the galvanic current was the best method of all. He uses large moist clay electrodes, one over the cilio-spinal center and the other over the solar plexus, and does not hesitate to employ currents as high as seventy-five milliamperes.

Dr. W. W. Eaton, of Danvers, Mass., had made use of practically the same method as Dr. Rockwell, and with equally good results.

Zinc-Mercuric Kataphoresis of Tuberculous Glands—Dr. G. Betton Massey, of Philadelphia, gave an interesting demonstration of his method, exhibiting two patients so treated. He uses for the electrode a sharpened sliver of zinc amal-

gamated with mercury, the electrode, after the first application, being insulated except near the tip.

A Plea for Electro - Therapeutics Proper.—Dr. William J. Herdman, of Ann Arbor, Mich., arraigned the association for showing a tendency recently to indulge too much in border-line studies, and cited a case of osteo-sarcoma of the jaw, successfully treated by electrolysis, in support of the assertion that the constant current was still a valuable aid to the electro-therapeutist.

Radiant Light Baths in the Treatment of Neuroses.—Dr. Thomas D. Crothers, of Hartford, Conn., presented this paper, which was supplementary to his contribution of last year. He declared that increasing experience had only served to more firmly convince him of the value of this treatment. The feelings of the patient, together with the effect upon the pulse, temperature and secretions, warranted the assertion that the light bath was superior to the Turkish bath. The wide applicability of the method was evident from the fact that in so many diseased conditions one of the important therapeutic indications was to cause elimination of toxins.

The Use of the X-Ray in the Treatment of Malignant Growths.—Dr. Marcus M. Johnson, of Hartford, Conn., the author of this paper, said that, although a surgeon, he recognized the limitations of operative surgery, particularly as regards the treatment of malignant disease. He then reported a number of cases to show the better results obtained by x-ray treatment.

Radium, with a Preliminary Note as to Its Therapeutic Uses in Cancer.—Dr. Margaret A. Cleaves, of New York, presented a paper with this title. She said that radio-activity was measured by reference to that of uranium as a unit.

Until recently the radium in our market came only from Germany, and had a radio-activity of 300, but now it was possible to procure the French radium, with a radio-activity of 2,000 to 3,000. Apparently, radium gives off three kinds of rays, alpha, beta and gamma rays. The first, constituting the major portion, are similar to the x-ray; the beta rays correspond to the cathode rays; the gamma rays have a still higher rate of vibration. Little had as yet been done with radium as a therapeutic agent, but she had recently studied this phase of the subject with the aid of one gram of radium having about 7,000 radio-activity, and, as a result, she had been led to believe that radium possesses important therapeutic possibilities, greatly surpassing those of the x-ray.

The Present Status of X-Ray Therapy in the Management of Cancer.—

Dr. Clarence Edward Skinner, of New Haven, Conn., presented this paper. He looked upon the x-ray as one of the best means at our command for the treatment of malignant disease, because it was capable of yielding as large a proportion of cures and as small a proportion of recurrences in a given period as any other mode of treatment. The consensus of opinion at present seemed to favor the early use of the knife, following this by a thoro course of x-ray treatment, both to prevent recurrence and to relieve pain. Altho not definitely settled yet, it was probable that x-ray could not be charged with hastening metastasis. There seemed to be a difference therapeutically between the x-ray obtained from the coil and from the static machine, the ray from the former apparently having the power to penetrate the tissues more deeply. The operator who comforted himself with the thought that because his patient had been tanned by the x-ray burning would not occur would surely come to grief.

The Roentgen Ray as an Aid in Diagnosis.—Dr. Herman Grad, of New York, was the author of this paper. He urged that the Roentgen ray be employed as systematically in diagnosis as the microscope.

The Use of Galvanic Electricity in the Treatment of Cancer and Kindred Diseases.—Dr. William Winslow Eaton, of Danvers, Mass., read this paper. He reported eight cases of severe and advanced cancer that he had treated, for the most part by the continuous current. Of this number, one was living at the end of a year, one at four years, one at six and two at seven years after treatment. He commonly used a current ranging up to seventy-five milliamperes, reaching the maximum strength in the course of two or three minutes, and continuing the application for fifteen minutes.

THIRD DAY—THURSDAY, SEPTEMBER 24.

Committee on Current Classification and Nomenclature.—Mr. William J. Jenks, E.E., presented a full report for his committee. He asked that the term "galvanic current" be discarded, substituting for it, so far as possible, "constant current," and that the terms "induced" or "magnetic induced current" be employed instead of "faradic current." The speaker then read the report of Prof. Samuel Sheldon on observations with the currents obtained from static machines. Mr. Jenks added that, so far as he knew, no accurate measurements had yet been made of the effect of the human body on currents of alternating character and high pressure.

A Plea for an Accurate and Scientific Method of Roentgen Ray Treatment.—Dr. Mihran K. Kassabian, of Philadelphia, exhibited in connection with this paper ruled record blanks, intended to provide a ready means for the full and accurate recording of the patient's his-

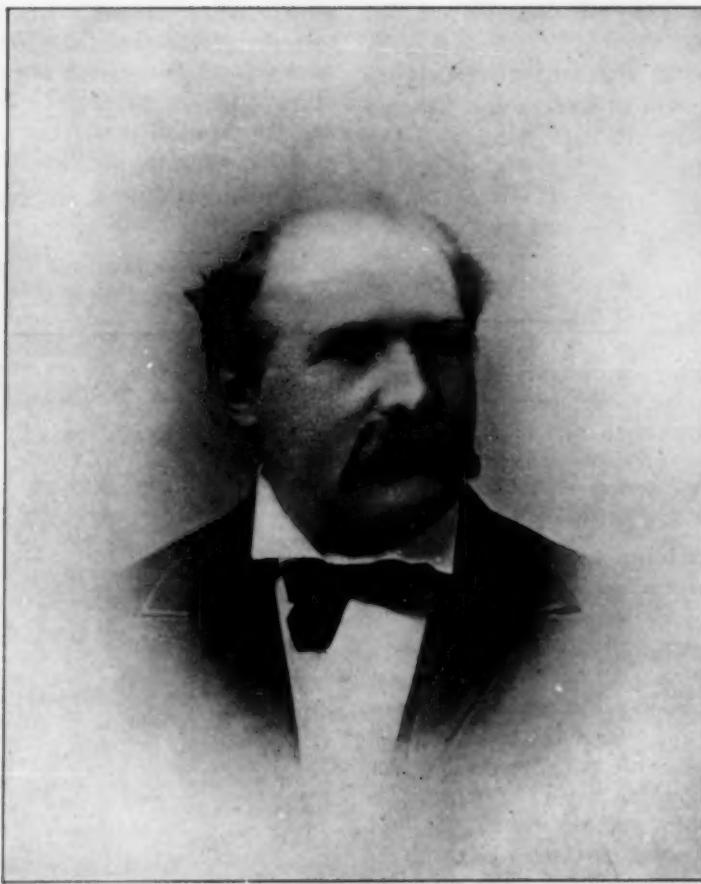
tory, the kind of apparatus employed, the special technic selected and the diagnosis. He urged that life-size photographs of each case be taken just before and just after x-ray treatment. Dr. Kassabian took the ground that the effect of x-ray treatment on the patient was dependent rather upon the number of interruptions and the depth of penetration of the tissues than upon the duration of exposure.

Perineuritis.—Dr. A. W. Baer, of Chicago.

The Electro - Thermal Bath — Dr. Charles H. Shepard, of Brooklyn, N. Y.

Officers Elected and Place of Meeting.—The following officers were elected: *President*, Dr. A. D. Rockwell, of New York; *first vice-president*, Dr. Willis P. Spring, of Minneapolis; *second vice-president*, Dr. William Winslow Eaton, of Danvers, Mass.; *treasurer*, Dr. Richard J. Nunn, of Savannah, Ga.; *secretary*, Dr. Clarence Edward Skinner, of New Haven, Conn. The next annual meeting will be held in St. Louis on September 13, 14 and 15, 1904.

The following were present at the meeting: D. R. Brower, C. O. Files, Fred H. Morse, Francis W. Bishop, Thomas D. Crothers, Marcus M. Johnson, A. D. Rockwell, Laura V. Gustin Mackie, Russell H. Boggs, Albert C. Guyser, W. P. Spring, W. J. Herdman, Charles R. Dickson, Maurice F. Pilgrim, F. A. Pease, George Z. Goodell, G. Betton Massey, A. W. Baer, Mihran H. Kassabian, Boardman Reed, Margaret A. Cleaves, R. G. Brown, Lucy Hall Brown, W. Winslow Eaton, J. H. Stewart, A. Rainear, W. R. Lough, C. N. Bibbins, R. J. Nunn, S. V. Bayeliss, Henry H. Cook, J. M. Lieberman, W. B. Snow, Robert Reyburn, Clarence E. Skinner, Samuel G. Slaughter, W. D. Haight, J. K. Roberts, L. M. Early, C. A. Foster, H. Grad, Ogden C. Ludlow, H. Preston Pratt.



DR. ROBERT NEWMAN
Who died at his
home
Monument Beach, Mass.
August 28, 1903

EDITORIAL

The death of Dr. Robert Newman has removed from us one of the sturdy pioneers in electro-therapeutics. In him indomitable perseverance and strong convictions were united with kindly courtesy and personal affection. His bereaved family have our deep sympathy.

The American Electro Medical Society.

The first meeting of the American Electro-Medical Society will be held in conjunction with the first meeting of the Illinois State Electro-Medical Society, December 1, 2, 3, 1903, at the Masonic Temple, Chicago.

Physicians and others attending the meetings of the society may purchase tickets for the International Live Stock Exposition, which will be held in Chicago November 28 to December 3, and for which round trip tickets will be sold for single fare plus two dollars (\$2.00) from points as far east as Buffalo and Pittsburg.

The preliminary program of the meeting will be published next month. Papers will be presented by Dr. John B. Murphy, Chicago; Dr. G. Betton Massey, Philadelphia; Dr. Byron Robinson, Chicago; Dr. J. Mount Bleyer, New York; Dr. C. S. Neiswanger, Chicago; Hon. John M. Smulski, city attorney for Chicago; Dr. J. Rudis-Jicinsky, Cedar Rapids, Iowa; Dr. H. Preston Pratt, Chicago; Hon. Edward B. Ellicott, city electrician for Chicago; Dr. Clarence E. Skinner, New Haven, Conn.; Dr. J. N. Scott, Kansas City, Mo.; Dr. R. S. Gregg, Chicago; Dr. Miran H. Kassabian, Philadelphia; Dr. T. Proctor Hall, Chicago; Dr. A. D. Rockwell, New York; Dr. Carl Beck,

New York; Dr. Heber Robarts, St. Louis, Mo.; Dr. Herbert A. Parkyn, Chicago; Dr. J. B. Pennington, Chicago; Dr. Maurice F. Pilgrim, New York; Dr. W. B. Snow, New York; Dr. John E. Gilman, Chicago, and a number of others. In connection with the meeting, there will be an exhibit of electro-therapeutic apparatus.

The Mighty Atom.

The London Electrical Review reports an address by Professor Rutherford to the Physical Society, London, June 5, 1903. Professor Rutherford states that there are four kinds of emanation from radiant matter: (1) Alpha rays are material particles positively charged with electricity and traveling with a velocity of about 25,000 kilometers per second. They have the same size as the hydrogen atom, and carry with them a very large amount of energy. They travel usually in straight lines and are bent from their course by a strong electric or magnetic field in a direction opposite to that of kathode rays. Alpha rays pass thru .005 millimeter of aluminum before their intensity is reduced to one-half. (2) Beta rays resemble the kathode rays produced in the vacuum tube, but are more highly penetrative. They consist of negatively charged particles (electrons) whose velocity is between 200,000 and 300,000 kilometers per second. The velocity of light is 300,000 kilometers per second. Beta rays can pass thru half a millimeter of aluminum before their intensity is reduced to one-half.

(3) Gamma rays resemble x-rays. They are not deviated by a magnetic field

and pass thru eight centimeters of aluminum before their intensity is reduced one-half.

(4) In addition to these, radio-active substances give off minute particles of matter which can be carried in a stream of air thru a tube or otherwise. These particles of matter can be condensed by very great cold (120° to 150° below zero C.). They behave like a radio-active gas with a molecular weight of about one hundred. The amount of matter involved in these emanations is so small that it would probably take hundreds of thousands of years to collect enough to be measured by a balance. It is possible to separate by a chemical process the radio-active part of uranium or thorium from the rest. But the active portions after a time lose some of their activity and the inactive portions regain it.

Professor Rutherford calculates that a grain of radium contains enough energy to raise five hundred tons a mile high. This calculation is based upon the assumption that the radiant energy originates in the radium and is not merely transformed by it.

An X-Ray Burn.

The following case occurred about six years ago when x-ray burns were frequent, and may be attributed to an imprudent use of the x-ray.

The patient was a healthy man, aged thirty-two years, who in exhibiting an apparatus exposed his right hand to the x-rays for two or three minutes each day for a week without bad results. Again after three weeks he exposed his hand in the same way for three weeks for a period of four hours daily. He now observed that the skin of the hand became very red and puffed up, but without pain. Inflammation gradually developed and he stopped work. The exposed area became

more inflamed and swollen, with aching and throbbing. There was also shooting pain extending up the ulnar side of the arm. After a week he consulted Prof Chambers, of Baltimore, who ordered hot water locally and bromides internally. In two weeks all the symptoms had improved. After three weeks the case came under the care of Prof. T. C. Gilchrist, of Johns Hopkins University. At this time the skin of the diseased area was deeply pigmented, the dorsal surface of the fingers being of a dark brown color and exfoliating in places. The skin was dry, infiltrated and wrinkled. At the lateral margins of the hand the surface of the epidermis was loosened, presenting a vesicular appearance, from contained air. The pigmented skin could be peeled off without pain, leaving a dull, dry, reddish surface beneath. The photograph which is represented here was taken at this time.

There was no increase of temperature in the hand and little or no swelling. After ten days, the epidermis being removed, the skin appeared glossy and tighter than normal over the fingers, and the palmar surface drier.

The first phalanx of the right index finger was found to be swollen and painful when pressed. This condition was found in the first and second phalanges of all the fingers but in a less degree. There was a very tender spot over the wrist joint, all the metacarpals being tender on pressure and the head of the second enlarged. The hairs were less numerous on the affected hand.

Movements of the hand were difficult and painful. When first seen voluntary movements of both hand and fingers, except the little finger, were abolished. Wrist movements were limited and painful and the thumb and finger could scarcely be opposed. The joints were very

stuff; he could not pick up a lead pencil.

Sensation was very much impaired and the sense of touch on the palmar surface was markedly decreased.

X-ray pictures were taken of the hand, showing the first phalanges thickened, particularly those of the index and second fingers. The heads of the second and third metacarpal bones appeared enlarged and their shafts slightly so. The space between the bones at the joints

mented; the vessels of the corium were dilated and the pigment cells of the papillæ almost as numerous as in the skin of a negro.

One year ago the patient was again examined. The roughened outline of the metacarpal bones was visible with the fluoroscope. Motor power had so far recovered that the patient could pick up a lead pencil, but not a pin. Sensation was much below normal. Outside of



AN X-RAY BURN.

were found narrowed, and the outline of the bones roughened and irregular.

On microscopic examination the horny layer of the skin was found thickened and partially detached, the mucous layer pig-

mented; the vessels of the corium were dilated and the pigment cells of the papillæ almost as numerous as in the skin of a negro.

these conditions no unpleasant results persisted.

The prolonged exposure to the rays apparently induced dermatitis, neuritis, periostitis and probably also osteitis.

Electro-Therapy.

A Heavy Electrical Shock.

Dr. Jellinek relates a case of a workman who had been subjected to the discharge from a 5,500-volt three phase circuit for five minutes and yet suffered no permanent injury, except to his hands and forearms, which were very severely burned. Details are given in *Neues Weiner Tegblatt*, March 20, 1903.

Alternating Currents Applied to the Abdominal Sympathetic Nerves.

Dr. S. Sloan (*Lancet*, May 30, 1903) finds neuro-muscular asthenia amenable to this treatment. Visceral neuroses, sickness of reflex character, and vaso-motor cases, were all treated successfully. In neurasthenia, in inflammatory pelvic conditions, in septic endometritis and in epilepsy little benefit resulted.

The Action on Bacteria of Electrical Discharges of High Potential and Rapid Frequency.—At a meeting of the Pathological Society, Mr. Alexander G. R. Foulerton and Dr. A. M. Kellas read an interesting paper on this subject, in continuance of a communication on the same subject presented to the society last year, showing that by discharging the current close to the surface of a fluid containing bacteria, held in a test tube, thru the bottom of which a platinum wire had been sealed, suspended organisms could be destroyed. The current used was one of from 2.5 to 5 amperes, the voltage varied from 35 down to 24, and the experiments were carried out in common air.—*Jour. A. M. A.*, May 30, 1903.

The Electro-Thermic Angiotribe in Varicocele.

Dr. O. Horwitz (*Proceedings Phila. Co. Med. Society*, March 31, 1903) recommends this instead of a ligature. It

reduces the danger of infection and there is less pain.

Special Skiagraphy.

Dr. A. V. Robinson, Beatrice, Neb., considers it impossible for anyone who is not familiar with chemistry, anatomy and physiology to properly interpret an x-ray picture. The operator must be prepared to meet with many failures. The source of x-rays is of the highest importance. Either a coil or static machine may be employed, but a good tube is difficult to find. After finding a good tube he advises it to be kept for photographic purposes only. A negative should be developed until it is of uniform blackness before it is placed in the hypo bath. Both sides of the body should be taken wherever possible for the purpose of comparison. Skiagraphy supplements but does not displace other means of diagnosis. If it is unreliable or incompetent the fault lies in the personal equation entering into the problem.

Photo-Therapy.

Therapeutic Use of Blue Light.

Dr. Danilow (*Klin. Ther. Wochensch.*, 1902, No. 45) reports the cure of a number of cases. Pain in both shoulder joints cured in nine treatments. Neuralgia in both shoulder joints cured in four treatments. Sciatica of four years' standing, in seven treatments. Sciatica following influenza, in five treatments. Trigeminal neuralgia in which the paroxysms resembled the malarial type, was cured in a few sittings, together with quinin. Bronchial asthma of nervous origin was promptly relieved.

Photo-Therapy in Chronic Pharyngitis.

Strebal. (*Archev. fuer Laryngologie und Physiologie*, B. 14, H. I.) used condensed and colored sunlight successfully

in reducing catarrhal inflammation of the mucous membrane. The action of the rays is increased when pressure is made upon the exposed part. No unpleasant result accompanied or followed the treatment.

Blue Light in the Treatment of Neuralgia.

Gabriele Arienzo found excellent results in six cases (*Annali di Electricita Medica*). He used a bell-shaped reflector to converge the light from a thirty-candle-power lamp fifteen centimeters distant. Treatments were given ten to fifteen minutes. He finds that blue light penetrates to the deeper tissues and has marked anesthetic properties.

Concentrated Actinic Sunlight in the Treatment of Tuberculosis.

Dr. J. W. Kime, Fort Dodge, Iowa, has been experimenting upon tubercular patients with a reflected sunlight. In the *Medical Record*, November 1, 1902, he reports sixty cases of pulmonary tuberculosis which have been or are under treatment. In twelve the disease has been arrested; in eleven more a probable arrest has been effected, one has not improved, five have been dismissed as incurable, and thirty-one are still under treatment. Laryngeal tuberculosis has yielded most readily to this treatment. He uses a thirty-six-inch reflector, so constructed that the light is focused three feet in front of it upon a spot eight inches in diameter. The reflected light is an intense blue, rich in actinic rays. It is thrown upon the bare chest of the patient two or three hours each day when the sun shines. It does not blister the skin but produces engorgement of the parts with blood; this brings increased nutrition and repair. The light is also a destroyer of bacilli. In pulmonary tuberculosis there is for the first few days increased dyspnea, which disappears later.

Smallpox and Red Light.—The suggestion to combat smallpox with the red light treatment has been abandoned by the health authorities in Philadelphia after consideration. It is an old idea, centuries old in fact, and is said to have been put in practice by the Arabians. Prince John, a son of one of the Edwards, was treated by this system. Everything was red. He was even given mulberry wine on account of its color. The theory is that daylight, and especially the chemical rays, have an injurious effect on smallpox

patients, inasmuch as the strong rays of the sun cause inflammation or sunburn in healthy persons. But experiments at the Municipal Hospital in Philadelphia did not confirm this theory. Only negative results were obtained there, as in other hospitals where the treatment has been tried. In Philadelphia the room used was painted red and had red glass windows. Red curtains obscured the doors and red globes covered the gas jets. The patients were neither harmed nor benefited. Within the last year a red light ward for the treatment of smallpox was constructed in the hospital in Indianapolis. One hundred and forty victims were put in this new ward and by way of experiment the same number of cases were placed in the ordinary ward. The results showed that the red light treatment was neither baneful nor beneficial, and the treatment was abandoned. In Norway and Belgium the red light treatment for smallpox is used extensively, and they contend with success in reducing the mortality list. But it is well to remember that in those countries vaccination is the universal practice. Reason, as well as tests, disprove the theory. Diffuse rays of light are not capable of inflaming the skin. Only the strong light of the sun does that. The negro has the best possible protection in his skin against the action of the rays of the sun, and yet negroes have more occasion to dread smallpox than white people have. So, too, if the actinic rays of the sun aggravate the eruption of smallpox, then the smallpox in summer ought to be worse than the smallpox in winter. Yet smallpox is usually more severe and more abundant in winter than in summer.—*Medical News.*

Radio-Therapy.

Dispatches from Berlin, Germany, state that Dr. Lunden has succeeded in curing two cases of blindness by means of the rays emanating from radium. A Vienna physician, also, it is reported, has cured a case of rodent ulcer of the lip by the same rays. Other cures by this means are also reported.

In the Hemisphere of X-Ray Activity.

Dr. J. Rudis-Jicinsky, Cedar Rapids, Iowa, in the *New York Medical Journal*, May 21, 1903, claims that the point of most intense radiation and penetration from a Crookes tube is directly opposite the center of the antikathode, decreasing from this point in all directions toward the dark hemisphere. Protection from x-rays is best given by sheet lead.

Proper Methods in X-Ray Therapy.

C. M. Mutz, Douglas, Kansas, in the *Wichita Medical Journal*, December, 1902, describes the apparatus required for x-ray work and discusses the nature of the x-ray effect.

X-Ray in Trachoma.

Drs. Stephenson and Walsh (*Lancet*, Jan. 24, 1903) have treated two granular lids successfully by x-rays and by high frequency brush discharges. Seventeen exposures were required in one case and six in the other; the average time was ten minutes. The treatment was found equally effective with the eyelids closed as when everted. Other cases are improving rapidly.

X-Ray Treatment of Pseudo Leukemia.

Dr. Inseen (*New York Med. Jour.*, April 18, 1903) reports two cases in which very marked improvement has resulted under x-ray treatment. In each case treatment had to be suspended for a time on account of toxemia. This disease has heretofore been considered incurable.

Influence of the X-Ray in Malignant Growths.

Dr. C. D. Brockman, Ottumwa, Iowa (*Amer. Jour. of Surg. and Gynec.*, June, 1903), corresponded with about fifty of the leading American surgeons asking for results of their personal experiences in the uses of the x-ray. Most of them reported favorably, some were doubtful, and a few said it had had no place in therapeutics of malignancy. As a result of his experience and reading he advises the use of the x-ray in

1. All cases of lupus, acne, persistent eczema and intractable syphilis, using a soft tube for eight to twelve minutes.
2. All external inoperable sarcomas, and to follow all operations on superficial sarcomas.
3. All superficial epitheliomata of the face so situated that incision would leave badly disfiguring scar.
4. All inoperable superficial cases, including mammary cancer.
5. All operations on superficial cancer, following operative work.

[It is better to also precede operation by x-ray treatment.]

Value of X-Ray in Malignant Growths.

Drs. Percy and Shields, of Cincinnati (*Cincinnati Lancet Clinic*, April 11, 1903) give a description of x-rays and state a number of conclusions which do not indicate a very comprehensive knowledge of their therapeutic properties.

Dr. Percy states that deep growths are unaffected by x-rays, that x-rays are not therapeutically active, that relief from pain is due to the high tension current and not to x-rays, and that x-rays have no power to destroy bacteria.

It is too late in the day to make it worth while to combat such misstatements as these. Dr. Percy may have been unable to accomplish much with x-rays, but

a very meager acquaintance with medical literature should have taught him something of what experts have done in this direction. It is exceedingly unwise for anyone to draw sweeping conclusions from his own failures.

Dr. Shields approved of x-rays for inoperable epithelioma.

Artificial Fluorescence of Living Human Tissues.

Dr. W. J. Morton (*Electrical World and Eng.*, June 20, 1903) says: "If a solution of bisulphate of quinin or of the alkaloid quinin, of the strength of one grain to eight ounces, contained in an ordinary glass bottle, is subjected to x-radiation in the dark these solutions will be seen to glow with a fine, opalescent violet-ray fluorescence." He calculates that the blood of a person to whom twenty grains of quinin has been administered is a solution of equivalent strength, and that when such a person is exposed to x-rays the tissues are rendered fluorescent in the same manner. In this way x-ray and ultra-violet treatment of internal tissues may be combined.

X-Ray for Keloid.

Dr. B. F. Carpenter, of New York, has treated successfully a case of keloid below and behind the external ear.

Influence of Radium on Organisms.

Bohn (*Comptes Rendus*, April 29, 1903) finds, as he expected from homeopathic principles, that radium rays exert a stimulating action upon the tissues when applied in small doses. He experimented upon the larvæ of frogs and toads. When these are exposed for a few hours at an early age to radium rays, abnormal development takes place later, the effect appearing to be latent during the interval.

Paget's Disease of the Nipple Treated by X-Rays.

Edith Meeks (*Boston Med. and Surgical Journ.*, June 18, 1903) treated a colored woman, aged 32. Improvement was marked in ten days and a cure resulted in four weeks. Treatments were continued two weeks longer.

The Red Light Treatment in Smallpox.

Niels R. Finsen (*British Med. Jour.*, June 6, 1903) argues that diffused daylight is bad for smallpox and that the exclusion of chemical rays and the use of red light only is one of the best modes of treatment.

Chronic Ulceration of the Leg.

Dr. W. L. Heeve, Brooklyn, N. Y., (*American Medical Monthly*), cleanses the ulcer with green soap and salt solution, then exposes to the x-rays from a tube of medium vacuum 10 to 15 minutes, repeating this at intervals of three to seven days. After granulation tissue begins to form he treats with the brush discharge from a static machine 20 minutes daily. He prefers the high frequency current to the brush discharge. He reports twenty-four cases of chronic ulceration cured.

Roentgen Rays in the Treatment of Inoperable Cancer.

Dr. M. L. Deming, in the *Fort Wayne Medical Journal*, October, 1902, describes the treatment of eleven cases, giving microphotographs of several, with marked improvement amounting to symptomatic cure in all but one. In this one case the patient received no benefit whatever, and in one other case the treatment did not at first relieve the pain. Treatment was given with the tube quite close to the skin at first. Exposures varied from 5 to 10 minutes. After raying they were sprayed with the static breeze. Dr. Deming says he has found the best results from frequent exposures with high in-

tensity to begin with, later giving more prolonged and less frequent treatments with somewhat reduced penetration of the rays.

X-Rays in the Treatment of Superficial Cancers.

Dr. A. L. Gray, Richmond, Va., in *Atlanta Journal-Record of Medicine*, April, 1903, says the most generally accepted theory is "that the rays are composed of negatively charged corpuscles or electrons. The theory of bactericidal action of the rays has been practically abandoned." Dr. Gray has confused the x-rays with the cathode rays, which are composed of negatively charged corpuscles. The fact that the x-rays are capable of destroying bacteria is pretty well established, tho there is no reason to believe that this is the usual result of their action upon the tissues. After referring to some very unfavorable cases which have been reported cured, he says: "It is well to bear in mind that not infrequently, from too short exposures, the diseased tissues are stimulated and the progress of the malady hastened. The remedy should, therefore, be faithfully and skillfully administered, lest evil rather than good result."

Malignant Growths Treated by the X-Ray.

Dr. B. B. Grover (*Denver Medical Times*, Jan., 1903) reports cure of epithelioma of the eyelid in a man aged 67. After thirty days' treatment with the soft tube some remaining induration required fifteen more treatments for its removal. Another case aged 72 had a tumor larger than an egg near the pyloric end of the stomach, which was diagnosed malignant by three physicians. As operation had been declined the x-ray was used on alternate days with a medium high tube four inches from the body for thirty-one treatments. The tumor disappeared and the patient recovered rapidly. A case of recurrent cancer of the breast

in a lady aged 66 was treated for two months with x-rays. The ulcer was reduced from eight inches to the size of a dime with no discharge, a tumor in the axilla the size of an orange disappeared and general health markedly improved. The treatment was given every second day.

Liquefied Oxygen and X-Ray Treatment of Malignant Growths.

Dr. A. C. White, New York, in the *Interstate Medical Journal*, December, 1902, says the nitrogen from ordinary liquefied air evaporates first, leaving almost pure liquefied oxygen. This may be kept in a bulb placed within a larger bulb, the space between the two being a vacuum. In this a gallon of liquid can be kept for two or three weeks. He uses liquid oxygen to freeze the surfaces of malignant tumors, with the result that hemorrhage is checked, odorous discharges from the ulcer first increase, then gradually diminish, and after some sloughing the process of healing begins. The resulting scar is very slight. In the treatment of superficial epithelioma he prefers liquefied oxygen to the x-ray. In scirrhus cancer where ulceration has not taken place, liquid oxygen is excluded; after ulceration, and particularly in case of hemorrhage, liquefied air is indicated. Where the destruction of tissue by the x-rays is not sufficiently rapid, liquefied oxygen is indicated above all other measures as a rapid and safe caustic which is without systemic effect. In sarcoma and internal malignant diseases the x-ray is indicated and liquefied oxygen excluded.

X-Ray Treatment of Cancer.

Dr. G. E. Pfahler reports in *Jour. A. M. A.*, January 3, 1903, the treatment of several cases of cancer by x-rays, and states the following conclusions:

"1. Both the coil and the static machine give good results, but the balance

of favor seems to be with the coil, as producing the quickest results.

"2. A low vacuum tube corresponding to an air gap of one and one-half inches seems to be universally accepted as the best for all superficial treatment, while for the deeper structures a higher vacuum tube corresponding to an air gap of three inches will give better and safer results, Dr. Morton recommends one as high as seven inches for this purpose.

"3. The distance of the tube from the exposed part will vary with the amount of energy and the resistance of the tissue, but seems to be safe at from twelve to three inches.

"4. The time of exposure should be from five to twenty minutes, depending on the reaction obtained, and should be repeated every second or third day, unless some contraindication should arise.

"5. The surrounding tissues are best economical method is the use of tea lead) in one or two layers, which may be covered on both sides by layers of adhesive plaster.

"6. Best results, judging from cases reported as well as my own experience, seem to follow when the skin has been brought carefully to a reddened condition and kept so, without producing ulceration. This may occur in twenty-four hours or not until several days have elapsed after the exposure producing it.

"7. I have found that dusting the open surfaces with equal parts of salicylic acid, boric acid and starch helps to keep the ulcer clean and assists in the formation of a cicatrix. Dr. Taylor recommends the use of an ointment of salicylic acid, ten grains to the ounce of vaselin.

"8. The time required to cure a superficial cancer is usually from two to six months. The deeper ones often require longer time.

"9. We can recommend the use of x-ray in all carcinomata, but especially

those that are inoperable or in which operation is refused. I would recommend that all cases operated on should be followed by a course of treatment by the x-ray. This latter method, I believe, would bring about the most rapid and successful results."

Results in Radio-Therapy.

Dr. H. R. Varney, Detroit, reports his experience in tuberculosis of the glands and joints, in various skin diseases, in lupus, and in malignant tumors. Of fifty cases of cancer, thirty-eight of which were inoperable recurrent cases, ten died, five were discharged incurable, four were referred for operation, four referred to other operators, eight are improving and still under treatment, and nineteen are clinically cured. Of seventeen carcinomas five were cured. Malignant conditions of the breasts which are pathologically the same do not react the same to x-rays. The combined treatment of surgical and x-rays is commended wherever practicable. Of thirteen sarcomas none have been cured, but there was relief from pain and reduction of growth. Of thirty-seven cases of epithelioma twelve were cured. The results obtained by a combination of x-ray treatment with the curet or a mild arsenical paste far surpassed those of either treatment alone. Mild x-ray treatment of cancer cases is likely to stimulate their growth. Of twelve cases of lupus ten were discharged clinically cured. The x-ray treatment of acne is gratifying. For hypertrichosis the x-ray treatment takes too much time. Keloid was completely cured. Mild x-ray treatment for chronic eczema is very satisfactory. Sycosis is rapidly healed. The x-rays were also found to prevent pitting in smallpox when applied as soon as possible after discharge from the hospital. A case of scleroderma was cured in a few treatments. In general hospital work

the x-ray is a powerful tissue stimulant for all forms of retarded healing, for painful adhesions, etc.

Dr. Varney finds that in rapidly growing cancers the best results are obtained by powerful x-ray stimulation. In conditions requiring long x-ray treatment over-stimulation results if periods of vacation are not given. Strict attention to every detail is necessary for success.

Sarcoma Treated by Excision and Subsequent Use of the X-Ray.

Dr. T. K. Holmes, Chatham, Ont., in the *Am. Jour. of Surg. and Gynecology*, describes the removal of a recurrent sarcomatous mass 5 by 7 inches from a farmer 44 years old. The tumor was first noticed 12 years ago. Its surface was ulcerated and bleeding. Four weeks after the operation daily x-ray treatments were begun and continued for two months; for another month treatments were given two or three times a week. The patient's health has steadily improved since and there is no indication of the return of the growth.

Lupus Treated by the X-Ray.

Dr. Stewart McGuire, Richmond, Va., describes in the *Virginia Medical Semi-Monthly*, Feb. 27, 1903, the use of the x-ray for the cure of lupus, but considers the outcome of the treatment as extremely doubtful. "I bought one of the first x-ray machines sold in the south and for over six years I have used it constantly in my practice. I have done good with it and I have done harm with it, but I have never succeeded in getting as positive results as some men report who have had much less experience with it."

Cure of a Case of Alveolar Melanotic Sarcoma.

Dr. Edwin Walker, of Evansville, Ind., in the *Jour. A. M. A.*, for May 2, 1903, describes the treatment of a farmer 31 years of age who was afflicted with a

black tumor just in front of the ear 1½ inches in diameter. The growth was excised but never healed. Recurrence was evident in two weeks, and the growth rapidly enlarged. A second operation was equally unsuccessful. The x-ray was then applied, at first ten minutes daily, then twenty, and later, thirty. Occasionally the reaction was so severe that treatment had to be stopped for a few days. After the third exposure improvement was apparent. After three months no evidence of the disease remained except the cicatrix. Treatments were continued once a week for another month. Up to the present there has been no indication of return. During treatments the patient steadied the lead screen with his hand in such a way that two fingers were exposed to the x-rays. These became very red and shed their nails, but are now regaining their normal condition. The diagnosis was made with the microscope by Dr. Wm. R. Davidson and confirmed by Dr. B. F. Kline.

X-Ray Treatment of Epithelioma.

Dr. Thos. A. Groover, Washington, D. C., in the *Virginia Semi-Monthly*, March 13, 1903, mentions two types of x-ray burn, one of which occurs within a few days or weeks after a severe exposure, and a second which occurs after repeated weaker exposures. The latter in some cases does not appear until a year or more after exposures have begun. It is extremely chronic, resisting all kinds of treatment. In cancer he finds that the best and quickest results are obtained by setting up a moderate degree of dermatitis. He has not found any individual idiosyncrasy regarding x-ray dermatitis and believes such cases to be rare.

He gives twelve-minute exposures with a moderately low tube, repeated on alternate days until three have been given. He then waits for complete recovery from

the reaction before renewing the treatment. Eight cases were reported, three of which are apparently cured, three more have improved so markedly that ultimate cure is hoped for. In one case nothing but relief of pain and possible inhibition of growth was hoped for, and one case of epithelioma on the inside of the lip of a man aged 73 received little or no benefit.

The Treatment of Carcinoma of the Rectum by Mercuric Kataphoresis —

This is discussed by Dr. G. Betton Massey in *Journ. Adv. Ther.*, May, 1903. Malignant growths are destroyed by a current of 400 to 1000 milliamperes continued from half an hour to two hours under complete anesthesia, using zinc-mercury anodes in the tumor. The advantages of the method are (1) immediate destruction of the malignant growth without damage to adjacent parts or danger of infection, (2) bloodlessness, ease of control and direction, and (3) the patient has little dread of the first or a subsequent operation.

Dr. Massey's method is deserving of more extended trial than it has yet received.

The X-Ray and Violet Radiations in the Treatment of Cancer and Other Diseases.

Dr. W. J. Morton, of New York, says in the *Medical Brief* that the excessive anticipations of curing nearly all cases of cancer are being dispelled. There are remarkable cures and remarkable failures. The one is as unaccountable as the other, for we know neither what cancer is nor what the x-ray accomplishes. Some of the reasons for failure may appear from infection of the bone, from cancerous ulcer due to the Crookes tube, and from x-ray dermatitis. Infection can apply only to the open wound cancer. The x-ray tube, because of its electrical qualities, attracts to itself the flying particles in the air and drives these to the ulcerous surface, if the

latter be not protected in some way. Morton now uses a layer of cotton over the open ulcers during treatment. A number of cases have been reported where septicemia followed the use of the x-ray upon an open wound. Referring to the remark often made that the x-ray at first did good, but afterward lost its power. Morton says that as long as the operator knew what he was about progress was favorable, and when he no longer knew what he was doing progress became unfavorable. He had seen one case in which carcinoma infected the entire dermatitis area of the arm of an x-ray exhibitor, and is confident that he has seen bone cancers produced in this manner and also secondarily infected, and thinks the operator can not be too careful. While extensive dermatitis in an open ulcer is not desirable, it is almost essential in a closed cancerous tumor in order to secure sufficiently intense x-ray action within. "With all honor to Prof. Finsen for being the originator of photo-therapy, I can not see but that the Finsen light is now entirely left in the rear by the x-ray."

Salt Cure for Cancer.—It is reported from Simla, India, that Captain Rost, of the British Army Medical Service, has announced that he has discovered what he believes to be a cure for cancer. Captain Rost has been investigating the matter for three years at the hospital Rangoon, Burmah, and states that he has found in both carcinomata and sarcomata distinct germs of saccharomycetes, which can only develop when the natural chlorine in the tissues falls below the normal quantity. Captain Rost proceeded with treatment suggested by this fact, reinforcing the chlorin of the body by special diet, enabling large quantities of common salt to be absorbed. Eight patients have been made the subjects of experiment. One is said to be completely cured, and the condi-

tion of the others improved. The experiments are being continued.—*Medical Record.*

Methods of Roentgen-Ray Treatment of Malignant Diseases of the Uterus, Rectum and Bladder, with Description of Tubes.—This is the subject of an interesting paper by Margaret A. Cleaves, M. D., in the *Philadelphia Medical Journal*, April 18, 1903. Dr. Cleaves calls attention to the difficulty of successfully treating internal tumors by the external application of x-rays; both on account of the absorption of the rays by the intervening tissues, the attenuation of the rays on account of distance, and the danger from toxic products of diseased tissue. She finds none of these difficulties when the tumor can be approached by way of accessible mucous cavities with tubes so made that the x-rays are radiated from the part of the tube within the cavity. Heat-burns are prevented by a thin water-jacket over this part of the tube.

"Whenever the disease can be removed surgically, it should be done, and the x-rays used both before operation and subsequently."

Dr. Cleaves reports complete cures in inoperable and desperate cases under this treatment.

The Treatment of Epithelioma of the Eyelids by the X-Rays.—W. M. Sweet, (*Am. Med.*, December 13, 1902).

CASE I.—Squamous celled epithelioma of twelve years' duration, beginning in the skin close to the inner canthus, extending across the bridge of the nose and finally implicating the eyelids and tissues of the orbit. The conjunctival sac was obliterated by adhesions and the eyeball was atrophic. There was constant intense itching and occasional pain. Daily seances for two weeks, every other day for one month, every third or fourth day for two

weeks more, resulted in the skinning over of the denuded nasal portion and the diminution in size of the palpebral and orbital disease.

CASE II.—Epithelioma extending from the external canthus to the middle of the lower lid, and involving the skin of the cheek. Complete healing in four months (twenty-two treatments).

CASE III.—Probable epithelioma of lower lid near internal canthus. Completely healed in five weeks (ten exposures).

Microscopic sections of the tissue after a number of exposures show intense leucocytosis and degeneration of the epithelium, while normal tissue under the same conditions shows no change. Loss of sensitiveness to touch and relief of pain are expressions of trophic changes probably due to changes of degeneration in the finer nerve filaments. The technic is as follows: The healthy tissues are protected by sheets of tin-foil or lead. A low vacuum tube is placed six to ten inches from the tissue and the seance continued five to ten minutes. Serious burns which appear (if at all) from seven to ten days after the exposure, result from too prolonged or frequent exposures or when the tube is placed too near the tissue. The newly formed tissue is more pliable and less liable to contract than scar tissue. To guard against recurrence, Sweet advocates a continuance of the treatment a short time after healing is completed.

Roentgen Rays in the Causation of Cancer. (*Medical Record.*) The death of Dr. Blacker, who cured the king of a rodent ulcer and soon afterward himself died of epithelioma, was even more tragic than in a previous letter it was described to have been. There appears to be reason to believe that the disease which caused his premature death was due to x-ray dermatitis. While manipulating the appara-

tus, he is said to have received a severe burn on one of his fingers; the dermatitis gradually spread up the arm, and in its track malignant growths developed, first near the elbow and afterward in the axilla, finally involving the whole of the shoulder.

Epithelioma Under the X-Ray: A Preliminary Report.—Dr. J. Clark Stewart, of Minneapolis, described in detail a remarkable case of extensive involvement of the hand, which lent itself very well to histologic investigations. From the numerous sections cut, he had made the following observations: Fat degeneration was marked in all sections immediately after the beginning of the treatment. This never occurred in epitheliomata when undisturbed. This deposit, as shown by osmic acid, was most marked in the nuclei and in the periphery of cells surrounding

the pearls. The second important change noted was the rapid and extensive vascularization of the part which normally contained no vessels worthy of mention. This should not be confused with the formation of granulation tissue. These vessels were first filled with red-blood cells; later they were displaced and the vessel was packed by leucocytes. The final result, just prior to entire destruction, was the formation of a fine reticulum filled with polymorphonuclear leucocytes and refuse which had undergone hyaline and other degenerations. The further history of the case showed a very important thing, *i. e.* that while the growth was destroyed, where it was directly exposed to the rays, it grew with such rapidity in places where it had been protected simply by the thickness of the skin as to necessitate extensive maiming operation.—*Med. Record*, May 23, 1903.

The Constitution of Atoms.

In his Romanes lecture, recently delivered at Oxford, Sir Oliver Lodge expounded some ingenious theories on the constitution of the atom. These theories were intended to give a consistent explanation of the recent remarkable discoveries about electrons and radio-active processes. The lecturer considered that the hypothesis suggested by the observed phenomena was that the atoms of matter are actually composed of these electrons, an equal number of positive and negative charges going to form a neutral atom and a charged atom having one kind in excess. On this view a stable aggregate of about 700 electrons in violent orbital motion among themselves would constitute a hydrogen atom, sixteen times that number would constitute an oxygen atom, and about 150,000 would constitute an atom of radium. "The attractiveness of this hypothesis," says Sir Oliver, "is

that it represents a unification of matter, and a reduction of all material substance to a purely electrical phenomenon. The strongest argument in its favor is that mass or inertia can certainly be accounted for electrically, and that there is no other known way of accounting for it.

This is, indeed, a very attractive theory, but it presents many difficulties which appear to be insuperable. An electric charge, it is true, obeys the same law of acceleration as a mass of matter, but we may have positive and negative charges of electricity, while all mass is of the same sign. The 350 positive units of electricity which, together with the 350 negative units of electricity, make up, according to Lodge's theory, the atom of hydrogen would exactly neutralize each other, and a hydrogen atom constituted in this way would have no mass. We must evidently go deeper than the

electric charges on the atoms to get the true explanation of inertia.

An equally attractive, and, we think, equally unsound, hypothesis was put forward by the lecturer to explain radioactive phenomena. Since the atom consists, according to his view, of an aggregate of electrons in violent orbital motion, each of these electrons is undergoing acceleration of direction, and is consequently radiating electric waves into space. It can be shown that this loss of energy will result in an increase of velocity of the revolving electron. When the speed of the electrified body reaches that of light its mass becomes infinite, and in that case a critical condition is reached in which the atom is no longer stable, but breaks up into other substances.

It is to be presumed that the masses of the positive and negative electrons which make up the atom, according to Lodge's theory, are equal, since their electric charges are equal. But no positive electron is known with a mass less than about 1,000 times that of the negative electron. The positive fragments thrown off from radium are about equal to this—i. e., about equal to the mass of the hydrogen atom. The disintegration of the atom gives no proof of the existence of the positive electrons imagined by Sir Oliver Lodge.

The Romanes lecturer appears to favor the view that each atom has a definite

length of life, at the end of which it breaks up, or disintegrates. This, indeed, follows from his theory that disintegration is due to the loss of energy by radiation of electric waves. He draws an analogy between the collapse of the atom and the contraction of a nebula, which at certain stages becomes unstable and throws off a planet, the residue constituting an extremely radio-active mass, or sun. But whereas the astronomical changes observed in cosmic configurations of matter occur in a time reckoned in millions of years, the changes to be expected in the more stable atoms would seem likely to require a time reckoned in millions of millions of centuries. Each atom, according to this hypothesis, has a definite lifetime, and the radioactivity of a substance would be proportional to the death rate of its atoms. With equal length of life, the death rate of atoms would be the same as their birth rate, but Rutherford has shown clearly that radio-activity decays according to a law of geometrical progression—that is, the death rate of the atoms is proportional to the number of the survivors. This does not point to a fixed lifetime for the atom, but rather to the view of J. J. Thomson, that a fixed percentage of the atoms always reaches a critical velocity, which determines their disintegration.—*Editorial in London Electrical Review.*

Electricity in the Treatment of Chronic Deafness.

BY GEO. Z. GOODELL, M. D., OF SALEM.

Chronic catarrhal otitis media was the disease considered in its various forms. The paper was a condensation of the literature on the subject, together with personal investigations by the author and interview with those who had recently used electricity in this disease.

A short summary of the anatomy, physiology and pathology of the parts involved was given.

The author found recommended for this disease, interrupted, continuous, and

Abstract of a paper read at the Thirteenth Annual Convention of the American Electro-Therapeutic Association, at Atlantic City, N. J., Sept. 22, 1900.

static electricity, high frequency currents, ozone, electrolysis, and the use of various apparatus energized by electricity. Various combinations of these have also been used.

In the use of the interrupted and also the continuous current, mild currents were used about three times a week for months at a time. Tinnitus was often relieved and deafness helped at times.

Static electricity is seldom mentioned for this disease and high frequency currents have few advocates. Ozon has been used with some success by pumping it into the middle ear.

The method advocated by Dr. Robert Newman and Dr. A. B. Duel, of dilating strictures of the eustachian tube by electrolysis was enlarged upon at some length.

Some Therapeutic Uses of the X-Ray.

BY W. P. SPRING, M. D., MINNEAPOLIS.

Since I have been giving special attention to the use of the x-ray, I have had twelve cases of epithelioma about the face, nine of which have been cured. One of them was a recurrent cancer of the eyelid, in which the eye was exposed without injury. Of the remaining three, one, a very old man, was too feeble to continue treatment, and died of other causes. One that had a fungating growth in front of the ear, the size of the palm of a hand, was benefited by the rays, but the pain, instead of being relieved, seemed to be increased. He began taking morphine, lost courage, and discontinued treatment. One recurrent gland under the jaw is still under treatment.

I have had six cases of lupus vulgaris; three of them are practically cured; one, a disseminated case on the face, is greatly improved; one, with an ulcer at the inner canthus of each eye, is nearly well after a short series of treatments; and the last case has just commenced treatment.

The various forms of pneumatic massage and the telephone-like instruments, such as Tracy's electrophone and Hutchinson's massacon, were spoken of and each with some recommendation.

Ten cases were reported occurring in the author's practice, in nine of which the interrupted current was used, with relief of the tinnitus and deafness in two cases, and no benefit in seven. In the other case (a recent one), high frequency currents were used with no results at time of reporting.

Very little of permanency in results has been accomplished in this disease by electricity. The paper closes with a list of the gentlemen who were of personal help in its preparation and a few references to literature consulted.

Two cases of lupus erythematosus have both done well.

Two cases of acne rosacea, one with a very red nose, improving wonderfully.

One case of universal psoriasis, almost well after a short series of treatments.

Three cases of goitre that are progressing well. In these I am using in connection with the x-ray, applications of iodine, driven in with high frequency currents by the vacuum electrodes.

I have two cases of birthmark on the face; one just commenced treatment; one with an improvement in color of about 50 per cent after four months' treatment.

One case of chronic ulceration covering the upper surface of the glans penis, following chancroids, which had resisted the ordinary forms of treatment for about a year, yielded readily to the x-ray.

For epilation, two have recently commenced treatment. Two have had the hair all removed after about thirty-five

treatments, and are receiving short series of applications as the hair recurs.

In a case of vascular warts on the chin, referred to me by Dr. Vander Horck, the ray has caused the tumors to change in color, and become almost level with the surface of the skin.

A case of recurrent fibroma of the inner angle of the lids, referred to me by Dr. C. D. Wright, is doing well.

I have had eight cases of cancer of the breast. One of these referred to me by Dr. Snow, of New York, is receiving prophylactic treatment immediately after operation. Three of them are recurrent cases. One, referred to me by Dr. F. M. Rose, of Faribault, died of metastasis. Another, referred to me by Dr. F. A. Dunsmoor, received great benefit as to nodules in scar, but, owing to her being away from home and having no proper care or nourishment, I sent her home and have heard nothing further. Another, sent to me by Dr. A. W. Abbott, had recurrence in scar and also a gland in the axilla. This case was very severely burned, and since that time the scar seems to be healing, but there are still two small glands that are quite obstinate. One primary case, referred to me by Dr. W. A. Jones, is, I think, well. One primary case, referred to me by Dr. C. A. McCollum, with an ulcerated condition, is almost healed, but, owing to indefinite symptoms about the abdomen, I am very much afraid of metastasis. Two other cases with tumors in the left breast, one the size of a goose egg and one very much smaller, are both doing well.

One case of the larynx, referred to me by Dr. Watson, expresses himself as feeling very much better. A gland the size of a hen's egg under the jaw has entirely disappeared.

One case of recurrent cancer of the vagina, referred to me by Dr. Abbott, seemed to be improving for quite a

while, the patient gained in health and strength and had less pain, but it was only temporary. She has discontinued treatment, and I have just heard that the cancer has perforated the rectal and vaginal walls.

I have had six cases of sarcoma. One, a tumor in the anterior chest wall, following typhoid, referred to me by Dr. Knute Hoegh, received decided benefit during treatment, but stopped for some cause unknown. One case received prophylactic treatment, immediately after the second operation for sarcoma of the nose, and has had no recurrence as yet. One inoperable sarcoma of parotid, referred to me by Dr. F. A. Dunsmoor, died of metastasis, but the tumor of the parotid was held in check during treatment. One case of recurrence after Dr. Halsted's operation for sarcoma of the breast is progressing well. One case of osteosarcoma of the upper jaw, referred to me by Dr. A. B. Barton, after two operations had been performed, seemed to be checked for a time, but the final result was not satisfactory. One case of very large abdominal tumor, recurrent after removal of testicle, was remarkable in the fact that pain was entirely relieved, that the tumor reduced one-half in size, that a decided toxemia was caused which stopped treatment for three weeks, and yet at the end of three weeks a burn which was not in evidence before, developed, and that the tumor then increased to its former size, and the man died from exhaustion, never having suffered another moment of pain and having discontinued large doses of morphine, to which he was addicted.

Among the skin diseases treated by the x-ray, we have reports from Hyde & Ormsby¹, Snow², Varney⁴, Campbell², of very successful results in acne. Campbell reports fourteen cures, and in many of them there has been no recurrence after two years.

In chronic eczema, Hyde¹, Childs²², Varney⁴, report particularly good results in infiltrated, especially in localized patches, the itching being very early relieved.

For epilation the x-ray is satisfactory, only tedious, requiring about thirty treatments for the first removal and then from one to three subsequent series of treatments to entirely destroy the hair follicles.

Cures of keloid are reported by J. F. Winfield⁷, Pusey⁶, and Varney⁴. The Varney case had recurred three times after operation. Cure requires very strong treatment, even to burning.

Senn²⁴, Pusey⁴, and Childs²² report cures of Hodgkins' disease, but Williams reports recurrence in his cases.

Dickson²⁵ and J. F. Schamberg²² report cases of nevus of the face nearly cured.

Ferris⁵, Pfahler⁹, and Hyde¹ report thirty-six cases of psoriasis as cured.

It is early yet, however, to affirm that these cures are permanent.

Hart²⁷ and Murphy²⁰ report remarkably rapid cures in callous sinuses. I have had one case with equally good results.

Hyde¹, Rhinehart²⁰, and Varney⁴ have all had rapid results in sycosis; and Varney⁴ is using the x-ray to prevent pitting in smallpox.

Rodman reported, at the last meeting of the American Medical Association, good results in tubercular glands; and Varney⁴ also reports a cure in a few weeks of a case that had had five recurrences; another case cured in six treatments; another case in ten days; and in an inoperable case the neck was reduced two-thirds and the patient discontinued treatment.

In tubercular joints, Varney⁴ reports a cure of knee-joints in five months, and of a hand which had sinuses and dead bone so that the patient had fairly good mo-

tion. J. B. Murphy²⁰ reports three cases of recurrent results in tuberculosis of the spine.

Mayon²⁶ has reports of pannus and trachoma cured.

Eberhart²² reports cure of chronic gleet with the morning drop cured from three to fifteen exposures.

J. P. Lord¹⁵ reports a cure of sarcoma of orbit in one month.

Greenleaf²⁷ reports in twelve treatments relief of all symptoms in case of sarcoma of thyroid.

Kirby²⁸ reports a case of round sella sarcoma of neck, ulcerated, cured in fifteen treatments.

H. P. Pratt²⁹ reports a case of melan sarcoma of the eye cured, with no recurrence in nine and a half months.

Skinner³ reports osteosarcoma of upper jaw; died of toxemia, pain stopped; temporary cessation in growth of tumor; second, glands in neck, recurrent, died; third, glands in neck, also abdomen; neck glands cured, but died of abdominal trouble; fourth, fibrocystic uterus, died; tumor reduced in size; fifth, osteosarcoma of the orbit, recurrent, improving; sixth, abdominal wall, recurrent, improving; seventh, sarcoma of the abdomen, tumor nearly gone; eighth, ulcerated sarcoma of neck, cured.

Gibson³ reports a case of recurrent melan sarcoma of the mouth, symptomatically cured.

H. R. Varney⁴ reports thirteen cases: seven osteosarcoma; six lymphatic sarcoma, inoperable, no cures, but life prolonged and made comfortable.²⁶ reports a case of fibrosarcoma of rib, cured, patient died of typhoid, and the pathological examination showed the cure to be complete. Richmond³¹ reports a rapidly growing sarcoma of kidney cured. Dickinson²⁵ reports sarcoma of the right breast practically cured. H. S. Boardman²⁸ reports sarcoma of both sides

of the head and neck cured in eighteen treatments. J. F. Winfield⁷ reports sarcoma of jaw and glands of neck cured; no recurrence. Coley, at the last meeting of the American Medical Association, said that out of thirty-six cases of sarcoma, only four had been cured, and the best results were with toxins used with the x-ray. Pusey⁸ reports cure of sarcoma of neck in one month, with slight recurrence after five months. Osteosarcoma of shoulder had sixteen exposures; pain was stopped, but no effect on the tumor. Sarcoma of pectoral muscles treated one month; pain relieved, and tumor the same. H. P. Mosely¹¹ reports a recurrent sarcoma of orbit cured in two months. Beck²³ reports great improvement of osteosarcoma of the orbit. Beck²⁴ reports a melan sarcoma of the leg, recurrent, greatly improved.

SUMMARY.

I have found reports of seventy-four sarcomas of various forms, of these seventeen were reported cured, five improving, five died, and forty-seven had life prolonged and made more comfortable, although incurable. Probably further reports will cut down the number of cures.

In the field of cancer, Scheppergrill¹⁸ reports a cure of cancer of the larynx. Delavan²⁰ reports two cases with no results, two improving, and one very much better died of Bright's disease, and Snow⁹ reports one improving. Pusey⁸ reports cure of orbit. Grubbe⁵ reports great improvement in cancer in rectum. C. W. Allen¹⁰ reports one much better. Coley¹² reports improvement in sigmoid, but two cases in rectum died, no results. Gibson⁸ reports improvement of recurrent rectal cancer.

Only two cases of cancer of the stomach reported; one, by J. Rudis-Jicinsky¹³, had the symptoms relieved, but the patient died; and Skinner³ reports a case

improving, November, 1902, nothing since.

In cancers in and about the uterus, Grubbe⁵ reports an inoperable case treated at intervals from November 11 to May with remarkable results, the tumor decreasing in size and the patient getting back her strength. Pusey⁸ reports five inoperable cases, very bad; two died in one week, one in six weeks, one in three months, one treated four months and will die. Pain was relieved in all cases. Hopkins²¹ reports case of cancer of uterus, treated by the Finsen light one hour and the x-ray from five to eight minutes each treatment, with good results. Grubbe¹⁴ reports case of recurrence cured symptomatically in three months. Gibson⁸ reports case November, 1902, of primary, inoperable cancer; died after receiving temporary benefit. Skinner³ reports one case that had been operated upon twice, and all symptoms were helped, but the patient died of toxemia; second, primary extensive, relieved pain, made tumor smaller, patient died of toxemia; third, primary uterine, pain and discharge lessened, patient died; fourth, primary uterine, growth stopped; two cases with no results and one case which stopped treatment, pain and discharge were both better. Dr. Margaret Cleaves¹⁷ reports one primary inoperable case with a rectovaginal fistula; one recurrent scirrhus encroaching on the rectum, one half gone in six weeks; one primary extensive treated two months with result that hemorrhage stopped, also discharge and odor and size reduced to nearly normal. She uses a water-jacket and Caldwell's vaginal and rectal tube, also vesical without water-jacket. Pfahler⁹ reports one uterine and appendages, primary, had sixteen treatments with great improvement, then a burn, and patient stopped on account of fear of another burn; two, pri-

(To be Concluded.)

Correspondence.

THE AMERICAN X-RAY JOURNAL,

Chicago, Ill.:

Gentlemen—What is the best work on electricity for removing hairs from the face, etc.?

Your journal is a welcome visitor and is eagerly read.

Thanking you for any information you can give me, I am, yours fraternally,

G. H. M.

[Most of the works on electro-therapeutics discuss the removal of hairs, moles, etc., briefly. The technique is not difficult to learn, but it requires care and patience. A good paper on the subject was published in the *American X-Ray Journal* for August 1902, by H. P. Fitzpatrick, M. D., and was followed by another on "Some of the Little Known Uses of Electrolysis" in the same journal, May, 1903. These two papers give full instructions for treatment.—ED.]

CARACAS, VENEZUELA.

Dear Doctor—Please excuse me if I dare to write to you from this far away country on some questions about electro-therapeutics and the x-ray, but, being a subscriber to the AMERICAN X-RAY JOURNAL, I could do no better to obtain the most efficient reply.

What is the Francois Crotte treatment of pulmonary tuberculosis, and in what work or journal can I obtain full instructions about it?

Which is the most reliable electro-therapeutic or x-ray treatment of this disease?

Very truly yours, Dr. G. D. P.

[Perhaps some of our readers can enlighten us regarding the Francois Crotte treatment.

Good results have been obtained in a large number of cases with x-ray treatment of pulmonary and other forms of tuberculosis. The x-rays are applied from a moderately high tube, high enough to show a little light through the chest, at a distance of twenty-five to fifty cen-

timeters from the body. Only very thin clothing should be worn during an exposure. Treatments are given two or three times weekly, five or ten minutes in duration, and the position of the patient in respect to the tube is frequently changed. No screen is used. Care is taken to have the patient well nourished, and very great care to see that elimination is sufficient.

If the patient grows weaker it is an indication that the treatment is too strong or too frequent, or that nutrition or elimination is defective.

In young persons pulmonary tuberculosis is frequently accompanied by tuberculosis of the intestines and in such cases improvement will continue for a time then cease. The tube should then be lowered so as to treat the intestines.

Reports have been received of good results in treatment of tuberculosis with high frequency currents. These are applied all over the surface of the chest for ten or fifteen minutes daily.—ED.]

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